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ABSTRACT

This study focuses on the significance of specific maternal language teaching techniques in the early language development of the child. A recording was made of the verbal and nonverbal interactions in 20 mother-child dyads during a one-hour session in the home. The linguistic level for each of the children, who ranged from 1.9 to 5.0 years in age, was computed from the average length of utterance, and the stream of verbal actions was divided into verbal episodes. These episodes, comprising one or several utterances of each interaction partner which are temporally contiguous, meaningfully related, and form a structural whole, formed the basic unit of analysis. Results indicate that mothers actively teach all aspects of language and that the interactional structures employed in the course of this teaching encompass feedback cycles and calibration processes. The mother-child dyad is described as a self-regulating and relatively closed system and it is suggested that the amount, the type, and the timing of the observed teaching/learning processes suffice to explain the phenomena and products of first language acquisition. (CD)

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Processes of Language Teaching and Language Learning in the Interactions of Mother-Child Dyads

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Running Head: Processes of Language Teaching by Mothers

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Abstract

The verbal interactions of twenty mothers with their children, who were between 1.9 and 5.0 years old, were recorded and analyzed. The recordings were done in the home to assure ecological validity. The results indicated that mothers actively teach all aspects of language, including syntax and morphology. The interactional structures employed in the course of this teaching encompass feedback cycles and calibration processes. The mother-child dyad is therefore described as a self-regulating and relatively closed system. It is suggested that the amount, the type, and the timing of the observed teaching/learning processes suffice to explain the phenomena and products of first language acquisition.

00003

Processes of Language Teaching and Language Learning in the Interactions of Mother-Child Dyads

In contrast to previous assertions (Brown, Cazden, Bellugi, 1969; Cazden, 1972), it has been shown increasingly during recent years that mothers are using a large variety of specific techniques to instruct and correct their children during the process of first language acquisition. The first evidence supporting such complex teaching activity was provided by Bullowa, Jones, & Duckert (1964). Drach (1969) and Pfuderer (1969) reported similar results based upon a larger number of subjects. These findings together with more recent studies (Baldwin & Baldwin, 1973; Frank & Seegmiller, 1973; Moerk, 1974, 1975; Nelson, 1973) have cast strong doubts upon the previous assertions that the environmental input could not possibly suffice for first language learning.

As a reflection of this changed attitude, recent child development texts (Gordon, 1975; Mussen, Conger, & Kagan, 1974) are already stressing the importance of parental teaching for the child's language acquisition. Specific evidence to support this contention is, however, still sparse.

Indirect support for the effectiveness of specific language teaching techniques has been provided by laboratory studies. The research of Bandura and Harris (1966), Odom, Liebert, & Hill (1968), and Liebert, Odom, & Hill (1969), the studies of Whitehurst (1971, 1972, 1973), Nelson, Carskaddon, & Bonvillian (1973), and by Fowler and Swenson (1975) demonstrated repeatedly that specific instructional and reinforcing strategies do lead to language acquisition or can speed it up when training is provided systematically.

Experimental studies can, however, only demonstrate what could be taught by parents and not what is actually taught by them. Yet when investigators visited the homes and studied the actual interactions of mothers and children, they did not effectively utilize all the information available to them. Generally, they reported only cumulative data on the teaching methods of mothers and on the language skills of the children at the same and at a later period in time. They did, however, not try to record the actual impact each maternal teaching strategy has upon the child. Cumulative data and correlations, though they suggest that a teaching strategy may have been important, do not demonstrate the processes in the teaching/learning situation.

That processes, or circular reactions, are important was already propounded by Baldwin(1925) and by Lewis (1951, 1957). Similarly, Hess & Shipman (1967) and Cazden (1972) stressed that only immediate feedback leads to calibration between mother and child. Gewirtz (1969) presented a strong case for functional contingency analyses of mother-child interactions. Lewis and Lee-Painter (1974) and Lewis and Freedle (1974) provided a methodological discussion and some exemplary data to demonstrate the value of this approach. Because of the recency of the rediscovery of the functional contingency approach, it has been applied only in few investigations on first language acquisition (Moerk, 1972, 1975; Mann & Van Wagenen, 1975). The present study suggests a new methodological approach and adds some data.

Method

Subjects

The subjects were ten girls and ten boys with their mothers from normal middle class homes. The ages of the girls ranged from 1,9 (one year and nine months) to 5,0 and those of the boys from 2,4 to 5,0. When the children were placed in rank order according to their ages, the modal difference between two adjacent children was two months. For both sexes there was one maximum difference of twelve months; between two boys there was also a minimal difference of zero months. All three extremes appeared at the limits of the age range, the maximum difference at the upper age limit. English was the main language, although a second language was used in some homes and was understood by the child. The twenty pairs were selected from over thirty dyads; length of protocol and normalcy of interaction were the selection criteria. Protocols with less than one hundred utterances per member and those that contained evidence of tense and affected behavior were excluded. Observers were trained psychology students who had been previously acquainted with but were not related to the observed dyads. Each dyad had a different observer, who, being a familiar person, could blend unobtrusively into the behavior setting before he began the recording.

Procedure

The design of the study is cross-sectional. Only one interaction period for each mother-child pair, lasting one hour, was analyzed. The home situation was chosen as the setting for the observation and only mother-child interactions were analyzed. The behavior setting was described at the

beginning of the observation, and whenever changes occurred they were recorded. Mothers and children followed their usual routines while their language interactions were tape-recorded. The accompanying nonverbal behavior of both partners was recorded by the observers as completely as possible in written form and both types of information were included in the transcribed protocols.

Analysis of Data

The average length of utterance, in syllables, was computed as an index of the child's linguistic level. The stream of verbal interactions was subdivided into "verbal behavior episodes" by adapting the procedures of Barker (1968) and Barker and Wright (1955). The main criteria for the delimitation of these "verbal behavior episodes" were constancy of the theme and limited size range. A detailed discussion of this adaptation of Barker's system to verbal interaction was provided by Moerk (1972). The resultant "verbal behavior episodes" were subjected to structural, functional, and linguistic analyses.

Results

The functional/structural aspect of this analysis will be discussed in more detail, since it represents the main contribution of the present study. Verbal behavior episodes consist of at least one or several utterances of each interaction partner, which are temporally contiguous, meaningfully related, and form a structural whole. Many of these episodes are composed of the same or very similar sequences of utterances. A kernel of each

episode contrasts with several sub-structures, which can be inserted or omitted as the need arises. The sub-structures will be labelled "subroutines" in this report and their functional significance will be elaborated upon. All these structures, whether complete ones, kernel-, or sub-structures, consist of elements. These elements together with code numbers, which will be referred to in the structural analysis instead of the descriptive term, are presented in Table 1.

Insert Table 1 About Here

Table 1 is largely self-explanatory. Arabic numerals have been used as codes for the mother's utterances, and Roman ones for those of the child. The labels for specific utterance types are either self-explanatory or familiar from the literature. "Prodding", a somewhat less frequently encountered term, is used to describe a type of utterance, whereby the mother urges the child to say something. It is mostly encountered in the form of "Can you say . . .", or "Say . . .", plus the model of the word the mother desires the child to imitate.

While this table is mainly intended as a key for later analyses it also demonstrates the considerable variety of types of utterances that are encountered in everyday casual verbal interactions between mother and child. Much morphological and syntactic learning could derive simply from this variety of models. In the present corpora, the mother used a larger variety of interaction types than the child, and she used them in an instructionally sophisticated and discriminative way.

More important than the consideration of these single utterances is the question of how and in which function they are used in the interaction process. A preliminary answer to this question is provided in Table 2.

Insert Table 2 About Here

In Table 2 are summarized the more common forms of nuclear interaction patterns and subroutines that were encountered in the present sample of twenty dyads. Columns two and three encompass the interactions and subroutines that are initiated by the mother and their frequencies in the entire sample, respectively. Since the represented structures are derived by simple numerical coding of utterances that were recorded in writing, the reliability of the encoding is almost one hundred percent. Columns five and six render the same information for the interactions and subroutines that are initiated by the child. Columns one and four are added to provide an item number for each type of interaction in order to facilitate reference to it in the text. Besides these more common forms, a considerable variety of idiosyncratic interactions was encountered. As these were very infrequent and as no specific importance of any of them has yet been discerned, they are omitted at present. They will, however, be further investigated on the basis of larger samples.

Concentrating first on the interactions initiated by the mother, two types of exchange have to be singled out because of their frequency: The most frequent type is that of question and answer (Items 3, 4, 5). This

kernel structure is mostly followed by other subroutines (N = 166) and appears less often in simple form (N = 49). In rare cases (Item 6, N = 7) the child responds to the mother's question with a question, signalling that he is not able to provide an answer.

The second most frequent form is that of modeling by the mother (Item 1 and 2) and imitation by the child. In this case, the kernel form is more frequent than the expanded form (N = 37 vs N = 18).

All the other structures represent subroutines, as indicated by the dash preceding the structural description in the table. It is evident from the types of utterances involved that all these subroutines serve a corrective function and/or provide linguistic information. The acceptance or acknowledgment of this information concludes the subroutines. It will be observed that direct correction or corrective expansion appears relatively often (Item 7, N = 34). Similarly, mothers often urge the child to produce a desired linguistic formulation (Item 9, N = 37). The "occasional questions", as defined by Brown, are found less frequently (Item 8, N = 9), but they also fulfill an instructional function. A short summation over these subroutines proves that, on the average, mothers provide through them alone more than five corrections per hour of interaction (N = 109, 20 hours of interaction), which are accepted and integrated by the child. These corrections could lead to new acquisitions or at least to a clarification of incompletely understood principles. Even if these would be the only instances of language teaching, the instructional intensity in the home would have to be considered high.

A somewhat different frequency distribution emerges in the interactions that are initiated by the child. Most frequently the child encodes something

spontaneously and the mother follows this up with a correction (Item 1, N = 108). These corrections are independent of those discussed in the previous paragraph and they represent new and different instances of language instruction. Less often do these spontaneous encodings of the child measure up to the mother's linguistic standards, so that she needs only to acknowledge and "reward" them (Item 2, N = 14).

When the child begins the interaction with a question, the mother responds differentially with one of three utterance types. Most commonly she simply supplies the required answer (Item 3, N = 58); in a considerable number of instances, however, (Item 4, N = 48) she is not satisfied with the linguistic formulation of the question and she first supplies a correction. In a few instances (Item 5, N = 9) another interesting phenomenon was observed: The child had become excessively dominant in the interaction and had bombarded the mother with questions even when the mother could surmise that the child knew the answers to his own questions. In this case she tried to switch roles and responded to the child's question with a question of her own, asking for the same answer. It was impressive to observe that in the majority of cases, the child could supply the answer, proving that the mother had assessed the child's knowledge correctly.

A third kernel structure is encountered as summarized under items six and seven: The child makes a request, but the mother does not fully understand the request (Item 6) or she is not satisfied with the linguistic formulation of it (Item 7). She responds, therefore, either with a question or with a correction. In this situation the child is, naturally, very intent to convey

his message effectively to his communication partner, since an instance of primary or secondary reinforcement may depend upon the efficiency of the communication. Consequently, corrections may be of perceptual/cognitive saliency and learning may be facilitated by this motivational constellation.

The last four items represent subroutines that are initiated by the child. The complete subroutines represent, however, a response to an utterance of the mother: The child either imitates/acknowledges an utterance modeled by the mother, or he responds to a question. The mother in turn either accepts and/or praises (Utterance 16, 17, 18) the child's linguistic production or she provides further corrections or information.

In most cases these units of interaction represent elements of larger interaction episodes, as signified by the dash preceding or following the interactions. Items from column 2 are either followed by items from column 5 or vice versa. In order to encompass the complete interaction episodes, a more complex form of analysis has to be performed. These analyses are briefly sketched out in the following figures. They can be read with the help of the key provided in Table 1. Flow-charts proved most appropriate to represent the interactions processes and sequences. This type of analysis was borrowed from systems analysis; it is also closely related to the branching programs of programmed instruction as developed by Crowder (1960) and the TOTE units of Miller, Galanter, & Pribram (1960). In accordance with generally accepted rules of representation, the direction from top to bottom and from the center to the periphery signalize temporal sequence. If other directions have to be used to demonstrate the temporal flow, this is

shown by means of arrows. Items in rectangles represent observed phenomena, diamonds symbolize inferred processes. The outlined interaction structures are commonly encountered, but they are not the most complex ones. Extra subroutines can be added in many instances, as evident from an integration of Table 2 and the following figures. Infinite recursiveness would be theoretically possible, though psychological limitations restrict the complexity of the verbal interaction episodes.

Insert Figure 1 About Here

Figure 1 illustrates a comparatively simple interaction between mother and child; the asking of questions by the mother. The sequence following the vertical direction in the center represents the simplest form of this interaction. Whenever problems appear in this exchange, the partners can employ a subroutine, presented left and right of the central axis, in order to reestablish efficient communication and/or to provide semantic or grammatical corrections.

If the child does not know the answer, he says so (Utterance XV) and the mother then provides it. Or he can counter with a question of his own (Utterance II, XIV). If the child answers the question, the first decision to be made by the mother is whether or not she has understood the answer. If not, she often repeats the same (Utternace 10) or a slightly reworded version, the occasional questions described by Brown (Utterance 8), and the interaction sequence starts anew. If the mother understood the answer, but it did not measure up to the linguistic standards she has set for the child, she will employ one form of correction or modeling (Utterance 1, 2, 4, 5, 6, 9, 12, 14, 20, 22). The child will then often respond with a form of imitation or will at least acknowledge the perception of the correction

(Utterance XVI). If the child's answer was satisfactory in all its essential aspects, the mother will respond with a form of secondary reinforcement, signaling the end of the episode.

In this interaction as well as in all the following ones a differentiation of functional elements can be discerned: Elements which serve usually or always to introduce an interaction or a subroutine stand in clear contrast to those which serve mainly a terminal function, signaling the completion of one interaction. The latter elements fulfill comparable functions for multi-utterance structures, as the period in written English or the falling intonation in spoken English does for single sentences.

Insert Figure 2 About Here

In Figure 2, the course of the interaction that appears often in response to a question by the child is charted. The central vertical sequence again represents the minimal commonly encountered elements. The parallel branches to the left and right of the central axis are frequent subroutines. The elements introducing subroutines and those signalling the successful resolution of the question are equivalent to those in Figure 1.

As already noted above, the first subroutine, beginning with a question asked by the mother, does not only appear when the mother did not understand the child's questions. It is also encountered when the mother wants to regain the controlling position in the interaction. In these instances, she counters repeatedly with a question of her own and in this

way switches the instructional technique from a mere rote recognition to a testing and problem solving situation. That the latter may be more conducive to learning is probable.

Insert Figure 3 About Here

In Figure 3, the mother's encoding of a message and the child's response to it are outlined. Of theoretical and practical importance is the fact that in the complete interaction, including the subroutines, the mother has the opportunity to provide linguistic information three times and she can check twice to see if it was received and incorporated by the child. Two whole TOTE units, providing repeated chances for calibration, are consequently encountered in this type of episode.

Insert Figure 4 About Here

Similar principles appear when the child spontaneously encodes a message, as demonstrated in Figure 4. In the previous figures, sequences that are often encountered as independent interaction episodes could be seen to be employed as subroutines, mostly in the form of questions or modeling. The same phenomenon is again found in Figures 4 and 5. The mother also adds sometimes further corrections or expansions after the child's last imitation (Utterance I, VII, VIII). Rare instances of recursiveness occur at other points of the structure, providing evidence of a high level of instructional flexibility.

Insert Figure 5 About Here

The intentional teaching activity of the mother is most clearly demonstrated in the case of Figure 5. A demand of the child could logically and most simply lead to a non-verbal response of the mother without any linguistic instruction or opportunity to improve the child's linguistic skills. In contrast to this expectation, it is very impressive how mothers consistently seize the opportunity to add a considerable amount of language instruction when the child makes a demand. The subroutines in Figure 5 are evidence of this instructional activity. The specific motivational/attentional aspects of this situation have already been pointed out above and they have been extensively discussed by Skinner (1957) under the heading mand.

The above figures and tables provided in a schematic and quantitative way evidence of the mother's instructional activity. Since much of the previous literature did not demonstrate such instructional activity or at most admitted it only in the case of vocabulary teaching, information about what is specifically taught by the mother is of great importance. A preliminary summary of this evidence has to be provided.

Insert Table 3 About Here

In Table 3 are summarized the raw frequencies for some items of instruction provided by the mothers. Since the protocols are of unequal

length, large idiosyncratic differences between dyads are encountered. The last column provides data adjusted for this unequal length. It represents the quotient of the sum of instructional acts divided by the sum of utterances of both mother and child, multiplied by one hundred. The following operational definition of "teaching" was accepted for the present purposes: Corrective feedback provided by the mother; an utterance of the mother that supplied linguistic information and to which the child responded by incorporating or acknowledging the input; questions asked by the mother to test linguistic skills of the child; and the mother's modeling of the translation of environmental behavioral structures, including pictures, into the linguistic medium. This delimitation is probably too narrow, since all correctly modeled utterances of the mother could serve a teaching function. At present, a restrictive definition is, however, preferable in order to avoid overinterpretations. On the basis of the above described rules, reliability checks were performed five months after the first counting of the types and frequencies of the mothers' instructions. The overall reliabilities were between 90 and 95 percent.

The data provided in Table 3 need only little interpretation. The main message to be derived is that all forms of instruction including grammatical instruction are encountered quite frequently. Up to 60 instances of teaching per hour of interaction, as seen in the second last column of the table, could lead to rapid acquisition of language skills.

Insert Table 4 About Here

Since the existence of age trends became highly probable from an inspection of the raw data in Table 3, the correlation of four of the instructional activities and of the cumulative frequencies with age and language level of the child are presented in Table 4. The frequencies of instruction in clause patterns and complex sentences were too small to calculate meaningful correlations. A decline in the density of instruction with the age and language level of the child is evident for these types of instruction. Some of these decreases are highly significant; but even those that are not significant are not negligible. In future studies when larger numbers of subjects will be used, stronger evidence for these trends will probably be found.

Discussion

While the presented quantitative results are by no means intended as normative, they suggest that new approaches to the analysis of verbal interactions can lead to results widely differing from those reported in the previous literature. That they may have a considerable degree of generalizability becomes probable from the fact that the subjects were selected in a random fashion from middle class homes. The clear and partially significant trends with the age and the language level of the children point also toward general principles and external validity. These age trends will be explored in more detail in future studies. The very valuable and extensive evidence provided by Broen (1972) suggests that partly different interactions are encountered with children below 26 months of age. The present observation

that the complexity of the interaction episodes increases with older children is another indication for age-specific trends.

In contrast to the preliminary nature of the quantitative data, the qualitative-structural aspect appears to be of high generality. It can be parsimoniously described in terms of the well-known TOTE units of Miller, Galanter & Pribram (1960): The mother obtains an answer, hears a spontaneous statement of the child, or an imitation of her own utterance and tests it by comparing it with her standards. If it is found acceptable, no OPERATION is needed. If not, the mother supplies linguistic information by means of a correction, expansion, etc. Thereafter she tests again to see whether the OPERATION was registered by the child and whether it had the desired effect. If the discrepancy is eliminated, the EXIT mode can be chosen; if not, another subroutine containing an OPERATE and a TEST phase can be added.

The standards are set by the mother. Though they are based upon the commonly accepted intuitions about the rules of one's mother tongue, they are not rigid. Previous investigations (Baldwin & Baldwin, 1973; Frank & Seegmiller, 1973; Moerk, 1974, 1975) demonstrated that the standards increase with the age and language level of the child. Snow (1972) demonstrated that both, age of the child and linguistic feedback provided by the child, influence these standards.

Another more methodological task pertains to the quantitative substantiation of the demonstrated structures of the interactions by means of time series analyses. The difficult problem of weighing the importance of transitional probabilities versus the impact of meaningful connections will have to

be tackled in this endeavor.

After it has been demonstrated that mothers actively and intensively teach language in the home, and after preliminary evidence has been presented of how theydo this, the psychologically and educationally most important question still remains open: It pertains to the relation between specific instructional methodology and the training of specific surface or base structures. Such an analysis will be presented in a forthcoming study.

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Table 1

Types of Utterances of Mother and Child and Their Code Numbers

Mother		Child	
Code	Type of Utterance	Code	Type of Utterance
1	Models from picture book	I	Imitates
2	Describes an object on hand	II	Asks a question
3	Describes an observed event	III	Answers a question
4	Gives corrective feedback	IV	Describes a picture in a book
5	Expands an utterance	V	Describes an object on hand
6	Utters an incomplete sentence	VI	Describes an observed event
7	Makes a rhyming statement	VII	Expands an utterance
8	Asks an occasional question	VIII	Labels an object
9	Answers a question	IX	Describes a past event
10	Asks a question in standard form	X	Describes own plans
11	Guides child's action	XI	Describes own act
12	Models a phrase not from a picture book	XII	Makes a demand/utters a wish
13	Describes own act	XIII	Describes mother's act
14	Prods child to improve a statement	XIV	Asks "What?" to show that not understood
15	Commands/utters a wish	XV	"I don't know" or similar response
16	Imitates in agreement	XVI	Answers "Yes", accepting a correction
17	Provides positive conditioned reinforcement		
18	Answers "yes"		
19	Lables an object		
20	Provides information		
21	"No" as feedback rejecting a formulation		
22	Describes child's act		
ø	No response	ø	No response
nv	Nonverbal response	NV	Nonverbal response

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Table 2

Types and Frequencies of Nuclear Interaction Patterns and Subroutines, That Were Encountered Frequently in the Present Sample

Number	Item	Frequency	Number	Item	Frequency
1	1, 2, 3, 12 / 13, 19, 20, 22, 23 -- I, VII[a]	37	1	IV, V, VI, VII / VIII, IX, X, XI -- 4, 4(1)[b] 8, 5, 10 --	108
2	1, 2, 3, 12 / 13, 19, 22, 23 -- I --	18	2	III, IV, V, VI / VIII, IX, XI -- 16, 17, 18	14
3	10 -- III	49	3	II -- 9, 19	58
4	10 -- III --	166	4	II -- 4 --	48
5	10 -- XIV, XV --	24	5	II -- 10 --	9
6	10 -- II --	7	6	XII -- 8, 10 (4)[b] --	16
7	-- 4, 5 -- I, VII, XVI	34	7	XII -- 2, 4, 5, 12, 14 --	30
8	-- 8 -- III, VII, VIII	9	8	-- III -- 16, 17, 18, 19	61
9	-- 14, 15 -- I, III, VIII	37	9	-- III -- 1, 2, 4, 5, 6, 9, 12, 14, 20, 22	63
10	-- 19 -- I, VIII, XVI	30	10	-- I, VII[a] -- 17, 18	21
			11	-- I, VII[a] -- 4, 5, 12, 19	15

[a] These elements appeared rarely in the specific interaction structure.

[b] If two utterance types were combined in an interaction as one utterance, both of them are specified together, the less predominant one in parentheses. The same principle of representation is used in the following figures.

Table 3

Frequencies of Specific Types of Instruction Arranged with Increasing Age and Language Skills of the Children

Name	Age/ Months	MLU	Phonemes	Vocabulary	Morphemes	Structure of subunits of clauses	Simple or coordinated clauses	Subordinated clauses	Sum	Sum/ Length
Jefferey	28	1.80	11	25	8	11	3	1	59	22
Melissa	24	2.66	9	17	7	12	7	0	52	13
Steven	34	2.80	7	39	5	11	0	0	62	13
Van	28	2.81	2	17	9	17	0	2	47	12.5
Jody	21	2.91	26	9	10	16	4	1	66	17.5
Jeanette	40	2.94	0	26	5	3	4	0	38	9
Chris	30	3.15	2	20	0	14	2	3	41	10
Cindy	30	3.27	0	3	0	2	0	0	5	2
Kelley	34	3.32	12	29	5	16	2	2	66	6.5
Mimi	54	3.74	3	45	2	7	1	2	60	6
Eddie	46	3.88	1	12	6	17	0	1	37	4.5
John	40	3.93	0	0	0	1	0	0	1	1
Jack	36	3.96	0	4	2	6	0	2	12	4.5
Julie	28	4.01	7	6	10	15	2	1	41	8
Sherri	42	4.08	3	39	5	16	0	3	66	14
Michael	48	4.54	1	4	5	9	0	3	22	4
Roger	42	4.88	2	18	1	7	1	0	29	4.5
Robin	60	5.17	1	5	0	3	0	0	9	1.5
Lori	60	5.87	0	6	0	10	0	5	21	5
Jamie	60	5.88	7	1	2	3	0	2	15	5.5
Average	39.25	3.78	4.70	16.25	4.10	9.80	1.25	1.40	37.45	8.20

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Table 4

Correlations Between the Frequencies of Specific Instructions and the Age and Language Level of the Child

	Phonemes	Morphemes	Vocabulary	Clause Constituents	Sum Items	Sum/ Length
Age/Months	-.49*	-.57**	-.11	-.22	-.44*	-.59**
MLU	-.37	-.54**	-.44*	-.17	-.57**	-.67***
df = 19						

*p < .05

**p < .01

***p < .001

Figure Captions

Figure 1. Interaction patterns commonly encountered when the mother asks a question.

Figure 2. Interaction patterns commonly encountered when the child asks a question.

Figure 3. Interaction patterns commonly encountered when the mother spontaneously encodes a message.

Figure 4. Interaction patterns commonly encountered when the child spontaneously encodes a message.

Figure 5. Interaction patterns commonly encountered when the child makes a demand.

Figure 1. Interaction patterns commonly encountered when the mother asks a question.

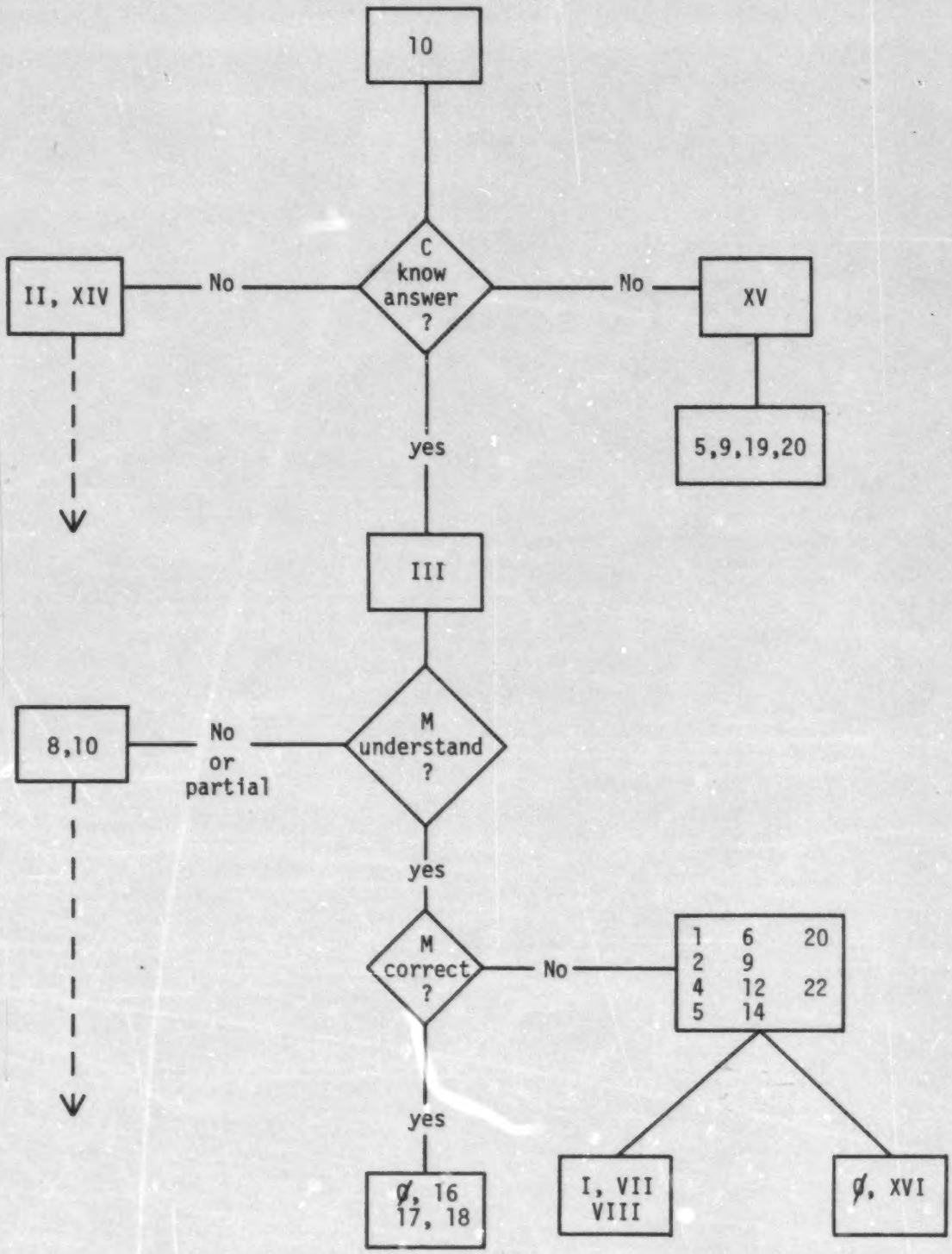

Figure 2. Interaction patterns commonly encountered when the child asks a question.

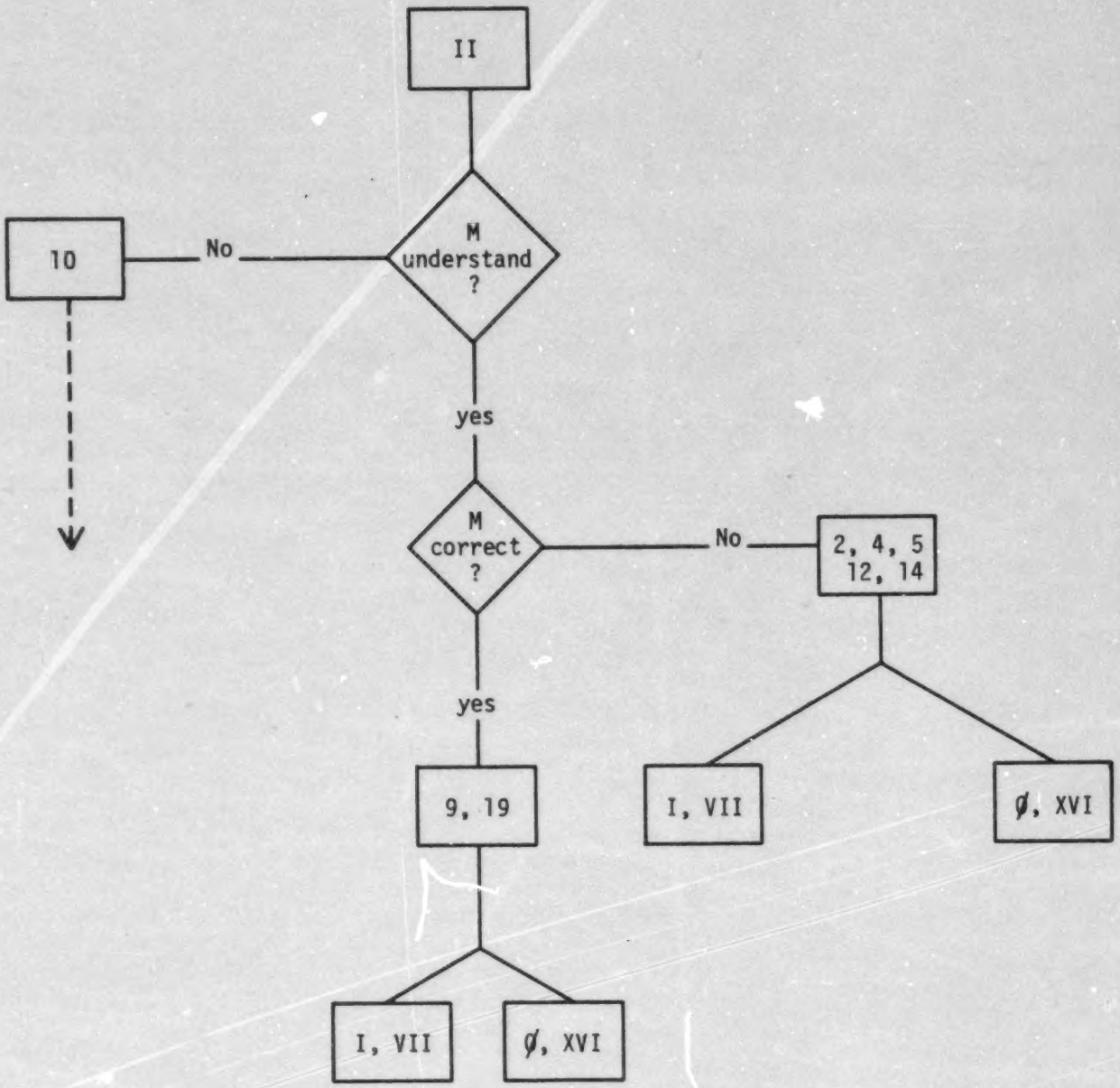

Figure 3. Interaction patterns commonly encountered when the mother spontaneously encodes a message.

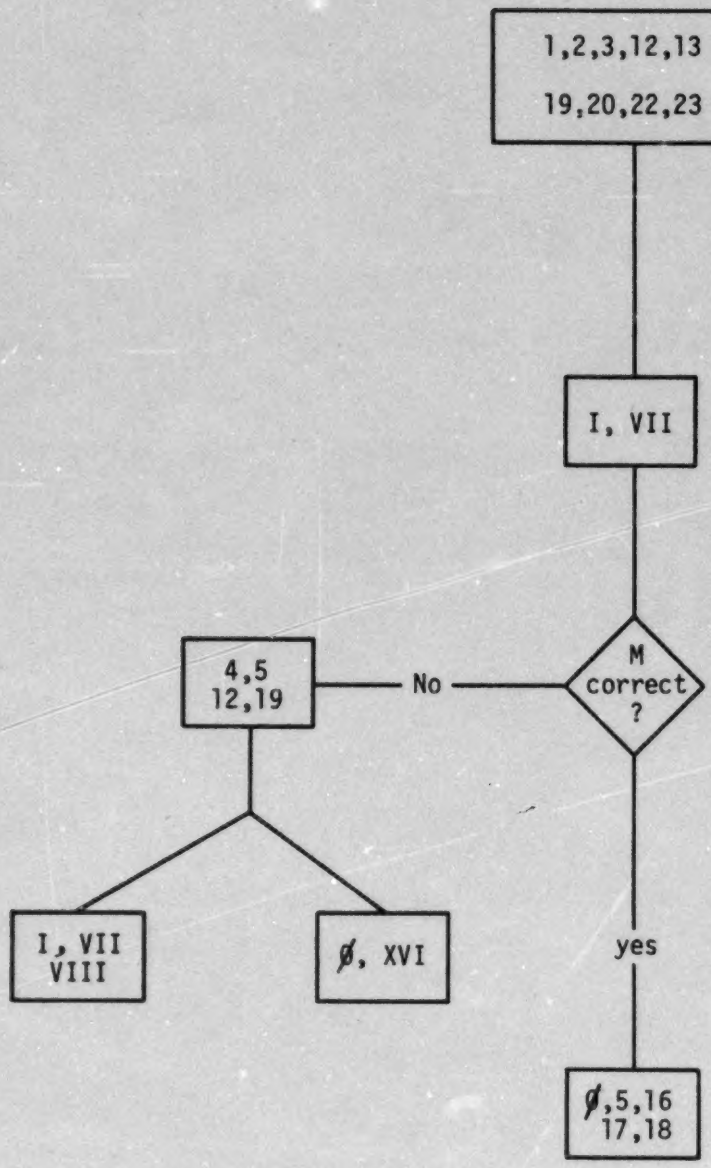

Figure 4. Interaction patterns commonly encountered when the child spontaneously encodes a message.

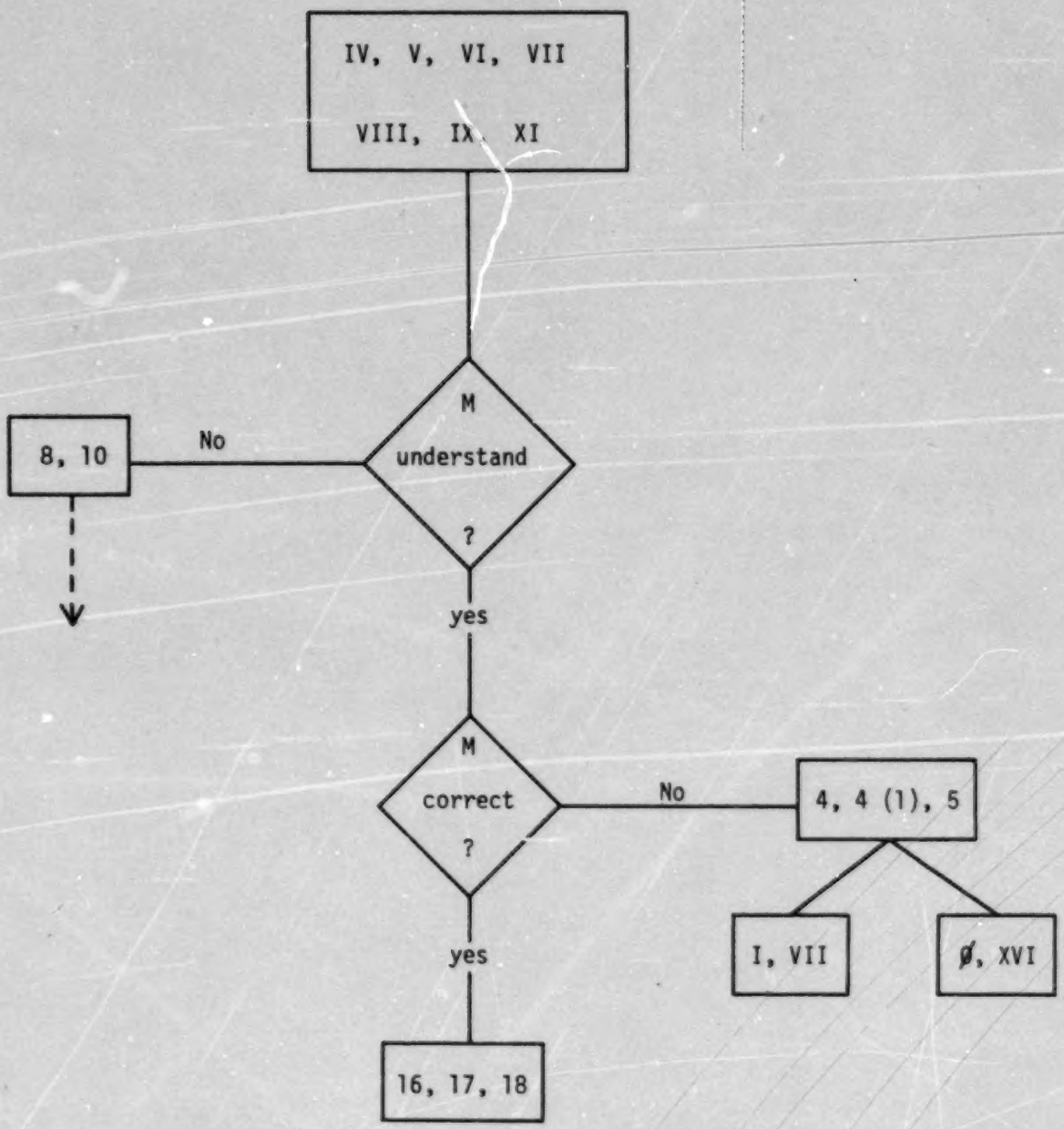

Figure 5. Interaction patterns commonly encountered when the child makes a demand.